



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: <b>PCT/GB94/02564</b></p> <p>(22) International Filing Date: <b>22 November 1994 (22.11.94)</b></p> <p>(30) Priority Data:</p> <table border="0"> <tr> <td>9324438.2</td> <td>27 November 1993 (27.11.93)</td> <td>GB</td> </tr> <tr> <td>9324437.4</td> <td>27 November 1993 (27.11.93)</td> <td>GB</td> </tr> <tr> <td>9324415.0</td> <td>27 November 1993 (27.11.93)</td> <td>GB</td> </tr> <tr> <td>9324416.8</td> <td>27 November 1993 (27.11.93)</td> <td>GB</td> </tr> <tr> <td>9324417.6</td> <td>27 November 1993 (27.11.93)</td> <td>GB</td> </tr> </table> <p>(71) Applicant (for all designated States except US): <b>SMITH &amp; NEPHEW PLC. [GB/GB]; 2 Temple Place, Victoria Embankment, London WC2R 3BP (GB).</b></p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): <b>MULLAN, Damian, Patrick [GB/GB]; 19 Lonsdale Street, Kingston-upon-Hull HU3 6PA (GB). SIVSHANKER, Selvarajah [GB/GB]; 32 Murray Street, Holgate, York YO2 4JA (GB).</b></p> <p>(74) Agent: <b>CORPORATE PATENTS &amp; TRADE MARKS DEPT.; Smith &amp; Nephew Group Research Centre, York Science Park, Heslington, York YO1 5DF (GB).</b></p>		9324438.2	27 November 1993 (27.11.93)	GB	9324437.4	27 November 1993 (27.11.93)	GB	9324415.0	27 November 1993 (27.11.93)	GB	9324416.8	27 November 1993 (27.11.93)	GB	9324417.6	27 November 1993 (27.11.93)	GB	<p>(81) Designated States: <b>AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ).</b></p> <p><b>Published</b></p> <p><i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>
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<p>(54) Title: <b>DRESSING</b></p> <p>(57) Abstract</p> <p>A dressing is provided with a loop to aid in positioning the dressing at a contoured region (e.g. the coccyx region) of a patient.</p> <div data-bbox="812 1260 1299 1680"> <p>The diagram shows a dressing (100) with a loop (20) for positioning. Other labeled parts include 30, 60, 70, 80, and 90, which likely represent different components or features of the dressing.</p> </div>																	

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**DRESSING**

The present invention relates to a medical dressing for a contoured body surface and to a method of applying such a dressing.

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Conventional wound dressings are usually planar and may be cut into various shapes to enable them to be more easily applied to a body surface than might otherwise be the case.

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However it is nevertheless sometimes difficult for such dressings to be applied to a body surface in a manner which avoids creasing or rucking. This is particularly the case where the dressing is provided with an adhesive coating over some or all of its body facing surface. Furthermore, even if creasing or rucking can be avoided, if the body surface to which the dressing is to be applied is

15

contoured then it can be difficult and time consuming to apply the dressing in an accurate manner over the contours.

20

In order to overcome or at least alleviate at least some of the above mentioned disadvantages, the present invention provides a dressing comprising a conformable material with a lower wound-contacting surface and an upper surface, characterised in that the dressing comprises a loop for receiving a body member of a user so that the body member contacts the upper surface and simultaneously

25

supports the dressing.

30

Preferably the wound-contacting surface of the dressing is an adhesive surface, for example, the wound may comprise an adhesive or layer coating at least partially coated with adhesive so that once the dressing is placed on a body surface in a desired conformation it can stay in that conformation when the hand is removed from the loop. Aptly, the adhesive is a pressure sensitive adhesive.

35

Desirably the loop is formed of a material of low tear strength such as card or paper so that it can be easily removed from the dressing by tearing it off without causing tearing of the conformable material. The tear strength of the loop may be such so that flexing of

the body member of a user of the dressing within the loop can cause the loop to break.

5 In order to assist in tearing of the loop, it may be provided with one or more areas or lines of weakness (e.g. perforation lines). One such line may be provided at each of two opposing parts of the loop at regions close to where the loop is attached to the remainder of the dressing.

10 Alternatively, the loop may be cut away from the remainder of the dressing once the dressing has been applied. In this embodiment the tear strength of the loop is not critical.

15 As a further alternative, the loop may be releasably attached to the remainder of the dressing for example by the use of repositionable tapes or by a hook and eye system such as VELCRO<sup>TM</sup> material).

20 It is not however essential that the loop be removed once the dressing has been applied since in some circumstances it may be the case that it is desired to leave the loop intact to provide an aid for removal of the dressing at a later stage.

25 The body member may be any part of the body of a user which can be inserted in the loop and used to apply the dressing. Preferably the body member is a hand or part thereof e.g. a digit or a plurality of digits (the term digit is used herein to include fingers and thumbs). For dressings intended to cover large areas of the body surface the loop may be sufficiently large so that two hands can be  
30 inserted therein when positioned side by side.

More preferably however the body member is a single hand. Since the size of peoples hands varies considerably, the size of the loop can be adapted accordingly. Typically the part of the loop  
35 through which the hand is inserted will have a length of from 10 to 20cm. This part may be from 1 to 4cm long if the loop is adapted to receive a single finger or thumb rather than a whole hand.

The loop may however be formed of stretchable material e.g. elastic material and in this case the preferred dimensions above apply to the loop when in use.

5

Preferably the loop is attached to the remainder of the dressing by attachment means located at the upper surface of the conformable material in order to avoid possible damage or contamination of the wound-contacting surface. Alternatively  
10 however it may be attached at the side of the dressing.

Any suitable attachment means e.g. adhesive, stitching, stapling, welding, etc. may be used to attach the loop to the conformable material of the dressing.

15

The term "conformable" material when used herein is not to be construed as indicating only a single material but includes composite structures such as laminates. The material should however be sufficiently flexible so that it can be manually deformed  
20 to adopt a desired conformation.

The term "loop" when used herein is intended to include any structure which is attached to the remainder of the dressing for receiving a body member of a user. Preferably the loop is a band  
25 which is attached to the conformable material by two opposed edges of the band.

In addition to the dressing of the present invention, there is also provided a method for applying a conformable dressing with a  
30 loop to a body surface; characterised by inserting a body member into the loop so as to support the dressing, causing the dressing to adopt a desired conformation, and contacting the dressing with the body surface. Preferably the loop is then removed from the dressing. The conformation adopted aptly ensures that the dressing can be  
35 applied to the body surface without substantial rucking or creasing.

The dressing may be formed by any suitable means. A sheet may be provided comprising a plurality of padded raised regions surrounded by relatively flat regions from which individual dressings can be cut to a desired shape. The padded regions can function to

5 provide cushioning and/or absorbency and are desirably shaped to fit against the coccyx region of the lower back.. The flat regions are desirably adhesive coated or self adhesive and function to hold a dressing in place. A dressing may be cut out from the sheet by cutting through the flat region to provide an appropriate shape.

10 Dotted lines or other guides may be provided to aid this cutting. Aptly the sheet is generally circular, semi-circular or generally shaped as a section of a circle.

In order that the dressing sheet can form a suitable template

15 from which a wide variety of dressings can be cut, it may be provided with a plurality of different sized raised regions.

Loops may be provided on the sheet or may be added to a dressing when cut from the sheet.

20

However the dressings of the present invention are formed, it may be advantageous to provide them with a layer of an absorbent material which is provided with a plurality of indentations extending at least partially through the thickness of the absorbent layer. The

25 indentations are preferably substantially parallel to one another and are desirably regularly spaced.

Such indentations can increase the conformability of a dressing. Indentations may be provided extending from both upper

30 and lower surfaces in a staggered arrangement.

Alternatively the indentations may extend from one surface and form a grid defining a plurality of areas of absorbent material which are spaced from one another by the indentations.

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The indentations may be e.g. slits, channels or grooves and preferably have a depth of at least  $\frac{1}{10}$  of the thickness of the

absorbent layer at the locations of the indentations. More preferably the depth of the indentations is at least  $\frac{1}{3}$ , e.g. at least  $\frac{1}{2}$  of the thickness of the absorbent layer.

- 5           The indentations may be defined by generally "V" shaped edges or generally "U" shaped edges (in cross-section), but other shapes are possible.

- 10           The absorbent material may have an upper and lower surface, wherein the lower surface is closer to a wound site than the upper surface when the dressing is in use. Desirably the upper and lower surfaces are generally planar.

- 15           The indentations may assist in dispersing wound exudate so that it can be absorbed across a larger region of the absorbent material than would otherwise be the case. This, together with the increased surface area of the absorbent material (relative to a surface without indentations) can assist in increasing the efficiency with which exudate can be absorbed.

- 20           The absorbent material can be any absorbent material which is suitable for medical use. Apt absorbent materials include elastomeric foams, particularly polyurethane foams, hydrocolloids and hydrogels. One such foam is available from Smith & Nephew  
25           plc (England) under the trade name **ALLEVYN**. Desirably the absorbent material is resiliently deformable.

- 30           Favourably the dressing comprises an apertured layer (e.g. a net) over the absorbent layer to prevent absorbent material directly contacting a wound site, but to allow wound exudate to be absorbed.

- 35           The net may have adhesive coated over some or all of its area. Alternatively, or additionally, adhesive may be provided at edges of the dressing, remote from the absorbent material. The net may be formed of elastic material. In another embodiment the net itself may be formed from an adhesive material.

In an alternative construction according to the invention, the absorbent material may itself have an adhesive proportion, e.g. a hydrogel adhesive. In such instances the provision of a net over the wound facing surface of the absorbent layer may be dispensed with.

5

Preferably the dressing has a waterproof outer coating. The outer coating may also be moisture vapour permeable to allow exudate/sweat to evaporate through the dressing.

10 The indentations may be formed, for example, by forming an absorbent layer in situ in a mould which has a plurality of projections complementary in shape to the indentations which are desired.

Alternatively, for example, where it is not practical to use a  
15 mould, the indentations may be formed by cutting parts of the absorbent material for example by knife-slitting or cutting with bandsaws or by melting it (e.g. by using heated wires).

Whether or not the dressings of the present invention are  
20 provided with indentations in a absorbent layer, the dressings may be provided with an adhesive coated periphery for use in attaching the dressing to a patient. Such an arrangement is well known in "island dressings" or "pouch dressings"..

25 The periphery may comprise a plurality of indentations extending inwardly from an outer edge thereof. This can be of assistance in helping the dressing to be attached to a highly contoured region of the body (e.g. the coccyx region of the lower back).

30

Desirably there are at least three such indentations but preferably there are four or more.

The indentations desirably decrease in width as they extend  
35 inwardly and may be defined by an essentially "V" shaped, an essentially "U" shaped or an essentially semi-circular edge.

Aptly the indentations only extend partially through the adhesive coated peripheral region so that there is a continuous band of adhesive at an inner part of the peripheral region to maintain an effective seal between a wound and the environment external to a dressing in place over the wound.

The indentations may be formed by an desirably means but are preferably formed by cutting.

10 Preferably the indentations are present on a dressing having a peripheral region which forms a bevelled edge. The bevelled edge may be straight or curved. The dressing desirably has an outer covering, which may be waterproof but water vapour permeable, an absorbent layer, located below the covering layer and optionally, a  
15 net located below the absorbent layer to prevent absorbent material entering a wound. The net, if present, may be at least partially coated with adhesive and may be elastomeric.

The present invention will now be described by way of  
20 illustration only with reference to the accompanying drawings wherein:-

Fig. 1 shows a plan view of the underside of a dressing shaped to be attached to the coccyx.  
25

Fig. 2 shows a cross-section through the dressing of Fig. 1.

Fig. 3 shows the dressing of Fig. 1 when applied to a patient.

30 Fig. 4 shows a coccyx dressing according to the present invention in plan view before a hand is inserted in the loop of the dressing.

Fig. 5 shows the dressing of Fig. 3 after a hand has been  
35 inserted therein.

Fig. 6 shows a plan view of a sheet from which several dressings can be cut.

Fig. 6a shows a cross-section through the sheet shown in Fig. 6 along the line A-A (not to scale).

Figs. 7 to 10 show various alternative sheets.

Fig. 11 shows in cross-section an absorbent foam suitable for use as an absorbent layer in a dressing with a loop according to the present invention. For ease of reference, only the absorbent layer is shown.

Fig. 12 shows in cross-section the foam of Fig. 11 when extended along the directions indicated by the arrows.

Fig. 13 shows the effect of curvature on the foam illustrated in Fig. 12.

Fig. 14 shows the underside of a dressing according to the present invention in which slits in the foam can be viewed.

Fig. 15 illustrates the underside of a dressing which is a variant of the present invention.

Fig. 16 shows a plan view of a section of absorbent foam having indentations in the form of a grid for use in a dressing according to the present invention

and Fig. 17 shows a raised area of a part of the foam shown in Fig. 16 deforming under pressure.

Referring to Fig. 1, a coccyx dressing 10 is shown from above which has an outer layer of moisture vapour permeable, liquid water impermeable film 30.

Fig. 2 shows the same dressing, but in cross section. The dressing 10 comprises an outer film 30, underlying which is an absorbent pad 40 formed of non-woven material. Wound exudate enters the absorbent pad through a perforated, adhesive coated wound-contact layer 20 (perforations and adhesive not shown, for ease of reference) and is then vaporised by body heat to form a vapour which exits the dressing through the outer film 30. This arrangement reduces the risk of maceration to the skin as well as the risk of bacterial contamination.

Fig. 3 shows the dressing 10 of Fig. 1 and 2 when correctly applied to a patient. The outline 50 of absorbent pad 40 is to indicate its position relative to the patient, although this would not of course be viewable when in use.

It can be appreciated from this figure that it is difficult to apply this dressing correctly because of the concave regions in the small of the back over which the absorbent pad lies.

Fig. 4 shows a coccyx dressing according to the present invention. This corresponds to the dressing shown in Figs. 1 to 3 except that loop 60 is now present. Loop 60 is attached to film 30 at each of two opposing ends of loop 60 via a weak adhesive (not shown). The adhesive extends along a length of the opposing ends along the outside 70 of loop 60 to cause the edges 80 and 90 of the dressing to adopt an upturned arrangement where film 30 is attached to the adhesive. In an alternative arrangement (not shown) loop 60 may be attached directly to surface 20. The wound contact layer 20 thus adopts a somewhat convex conformation over part of the dressing which is suitable for application to the concave body surface at the small of the coccyx region of the lower back. (it can however be appreciated that the loop 60 could be secured to the dressing by adhesive coated over the inside 100 of loop 60 and that in this arrangement the wound contact layer 20 would be caused to adopt a concave conformation in which edges 80 and 90 are downturned. Such an arrangement is of use in other types of dressing).

10

Fig. 5 shows the dressing of Fig. 4 with the hand of a user inserted through loop 60. The fingers of the hand can be seen to have passed through loop 60 whereas the thumb lies outside of the loop to aid in shaping the dressing for application to a patient and is maintaining the hand in position.

In use a user inserts a hand through loop 60 as shown in Fig. 5 and then lowers the dressing towards the coccyx region of a patient's lower back. By flexing the hand and/or moving the digits the conformation of the wound contact layer 20 can be adjusted to conform approximately with body contours. Pivoting of the wrist of a user of the dressing can ensure that flaps 110 of the dressing are accurately positioned over the lower surface of a patients buttocks and then the convex region of the dressing 10 can be accurately laid over the coccyx region. Once the dressing is in place the hand can be flexed against the loop 50 causing the loop to break due to the low adhesive strength of the adhesive by which it is attached to the dressing. Alternatively, in order to avoid possible trauma to the patient, the hand can be slid out from the loop 50 and the loop 50 cut off the remainder of the dressing using a pair of scissors.

It will be appreciated from the above that the dressing 10 can be applied accurately to a patient using only a single hand. This leaves the other hand of a user free for example to support the back of a patient in a desired position whilst the dressing 10 is being applied.

Referring now to Fig. 6, there is shown a view from above of a sheet 610. Dotted lines 611 and 613 indicate lines along which a particular coccyx dressing 615 may be cut to shape. They may be absent from the dressing or printed or embossed thereon. This view shows a number of raised, generally heart-shaped regions 612 which are radially spaced. Although the edges of these regions are shown on the drawing by distinct lines 614 this is merely for ease of reference since the heart-shaped regions have sloping sides, 617 as can be seen from Fig. 6A.

Turning now to Fig. 6A this cross-sectional view shows that the sheet 610 consists essentially of three components:-

5 a) There is an outer cover sheet 616, which is formed of "Opsite" film. This is moisture vapour permeable material obtainable from Smith & Nephew plc, which allows moisture vapour (e.g. from sweat or wound exudate) to evaporate through it, but which is also impermeable to liquid water so that the dressing is waterproof when in use.

10

b) Beneath the cover sheet 616 there is provided an absorbent foam 618. This is a hydrophilic polyurethane foam obtainable from Smith & Nephew plc under the trade name "Allevyn". The absorbent foam 618 is capable of absorbing wound exudate,  
15 liquid from which can then be evaporated through the cover sheet 616. The absorbent foam 618 forms the generally heart shaped raised areas 612 illustrated in Fig. 6.

c) Underneath the absorbent foam 618 is an adhesive coated  
20 net 620 which secures the dressing 610 to a body surface. Before use, the adhesive coated net 618 would be covered by disposable release sheets (not shown), loops (such as that shown in Fig. 4) would be provided, and the dressing would also be contained in a sterile package.

25

As is clear from Fig. 6A, regions of the foam 619 between the generally heart-shaped regions 612 and at the edges of the dressing are considerably thinner than the heart-shaped regions 612. This is achieved by radio-frequency welding at these regions 619 to form a  
30 laminate comprising cover sheets 616, foams 618 and adhesive coated net 620. Because of the high degree of compression of foam 618 at these regions 619 it is substantially less absorbent than at the heart-shaped regions 612. It can also be easily and accurately cut.

35 Figs. 7 to 10 show different possible arrangements of sheets according to the present invention. As is clear from Fig. 9 it is not essential to have differently shaped absorbent regions on the sheet

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(although such regions do provide an advantage of flexibility, in that a single sheet can be used to provide a wide range of dressings each of which are shaped to fit different wound sites).

5           Alternatively a single dressing may be cut to tailor fit an irregular wound site.

Referring now to Fig. 11, a hydrophilic polyurethane foam 1 is shown having a number of straight parallel slits 2 extending  
10           approximately half way through the thickness of the foam 1.

Fig. 12 shows how the foam 1 can be stretched laterally so that the edges 2 defining the slits become V" shaped. By laminating a lower layer such as a perforated wound contact layer to the lower  
15           face 3 of the stretched foam and an outer covering layer over the upper layer 4 of the stretched foam, a laminar dressing can be obtained, which has a plurality of slits defined by walls of "V" shaped cross-section.

20           Fig. 13 illustrates how the slits 2 increase the dressings conformability by allowing it to cover an area of high curvature (indicated by curve 5) without substantial creasing/rucking of the absorbent foam.

25           Fig. 14 shows the underside of a dressing 11 according to the present invention (loop not shown) having an absorbent layer 12 with a plurality of slits 13. An adhesive coated peripheral layer 14 is also shown.

30           Desirably a net or perforate film would be present underneath the absorbent layer 12, but this is not shown for the ease of reference.

Fig. 15 shows the underside of a further dressing (loop not  
35           shown), in which slits 21 are present at the underside of absorbent layer 22, but are arranged in a fan-like arrangement rather than being generally parallel to one another. This can be advantageous where

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the dressing is of an unusual shape since it enables the absorbent layer to readily adopt an irregular conformation, such as the kidney bean conformation shown therein, which can be used in a dressing to be applied to the coccyx region of the lower back.

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Referring now to Fig.16, the absorbent foam 13 shown can be used in a dressing of the present invention and is a hydrophilic polyurethane which has been formed in situ in a mould (as an alternative to moulding the channels 25, these may be cut out from an otherwise generally flat sheet) to give square raised areas 24 and "V" shaped channels, 25. The foam is deformable and can be bent to form a generally concave or generally convex shape so as to move the raised areas 24 closer together or further apart as appropriate, but without causing substantial creasing or rucking of the foam. The channels 25 can assist in channelling wound exudate through a large area of foam 23, when the foam is in use in a dressing.

Fig. 17 shows a section of the foam 23 illustrated in Fig. 16 in which one of the square areas 24 has been partially compressed. This illustrates that single raised areas can be partially compressed independently of other areas and is a useful feature for a pressure relieving dressing.

25

CLAIMS

1. A dressing comprising a conformable material with a lower wound contacting surface and an upper surface, characterised in that  
5 the dressing comprises a loop for receiving a body member of a user so that the body member contacts the upper surface and simultaneously supports the dressing.
2. A dressing according to claim 1 which is provided with a) a  
10 loop which is releasably attached to the remainder of the dressing, or b) a loop having a region of low tear strength so that the loop can be manually torn away from the rest of the dressing without tearing the conformable material.
- 15 3. A dressing according to claim 2 wherein the loop is provided with one or more lines of weakness.
4. A dressing according to any preceding claim where the loop is adapted to receive a hand or one or more digits of a user.  
20
5. A dressing according to any preceding claim, wherein the dressing comprises a perforated, adhesive coated wound contact layer, an absorbent pad and a cover layer of moisture vapour-permeable liquid water impermeable material.  
25
6. A dressing according to any preceding claim which is a coccyx dressing.
7. A method of forming a dressing according to any of claims 1  
30 to 6, comprising cutting a dressing shape from a precursor sheet comprising a plurality of raised and relatively flat areas, corresponding to padded and edge areas of dressings to be formed respectively, and attaching a loop to the dressing shape for receiving a body member of a user, if such a loop is not already present on  
35 the dressing shape.

15

8. A method of applying a dressing according to any of claims 1 to 6 to a body surface, wherein a body member is inserted into the loop so as to support the dressing and to cause it to adopt a desired conformation and the dressing is then contacted with the body surface.
9. A dressing according to any of claims 1 to 6 wherein the dressing is provided with an absorbent layer which comprises a plurality of elongate indentations extending partially through the thickness of the absorbent layer.
10. A dressing according to claim 9 wherein the indentations are substantially parallel to one another.
11. A dressing according to claim 9 or claim 10 wherein indentations are provided which extend from both upper and lower surfaces of the absorbent layer.
12. A dressing according to claim 11 wherein the indentations are substantially parallel to one another and the indentations extending from the upper surface are staggered relative to the indentations in the lower surface.
13. A dressing according to claim 9 wherein the indentations form a grid and the grid defines a plurality of areas of absorbent material which are spaced from one another by the indentations.
14. A dressing according to claim 13 wherein said areas are arranged in a regular array.
15. A dressing according to claim 13 or claim 14 wherein said areas have polygonal cross-sections.
16. A dressing substantially as hereinbefore described, with reference to the accompanying drawings.

1/5

FIG. 1.

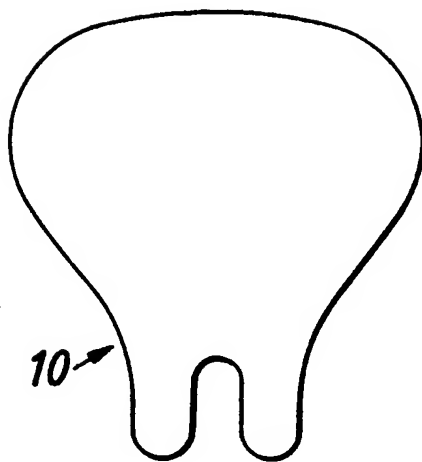


FIG. 2.

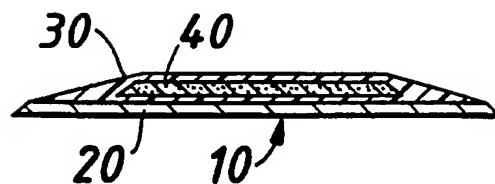


FIG. 3.

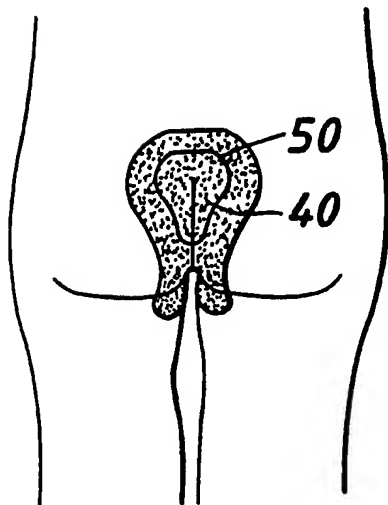


FIG. 4.

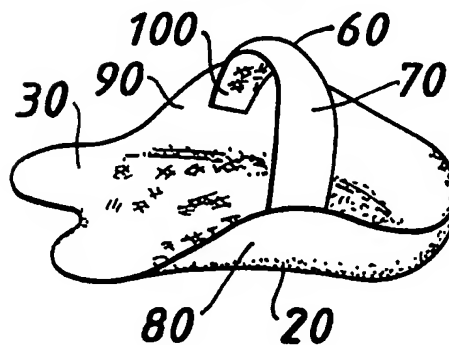
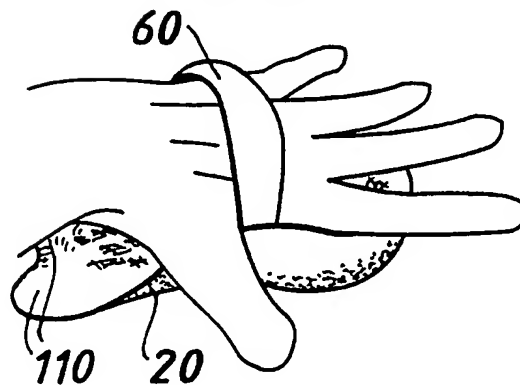
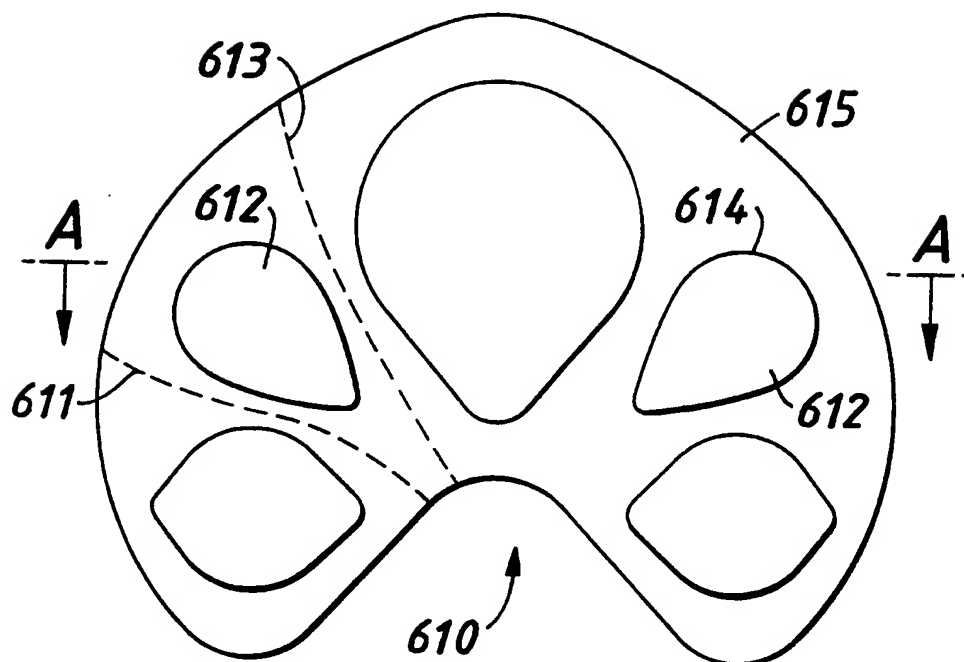


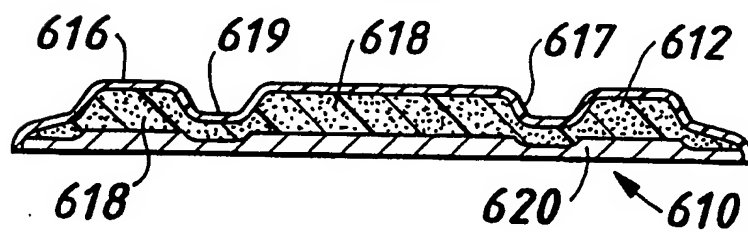
FIG. 5.



**FIG. 6.**

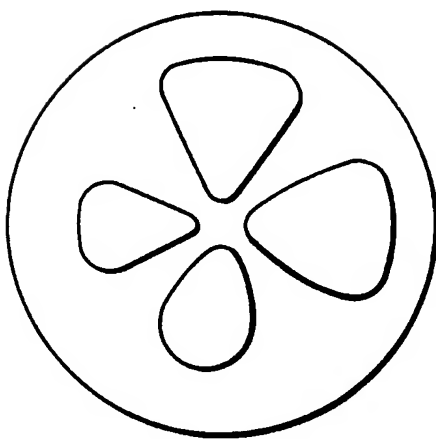


**FIG. 6A.**

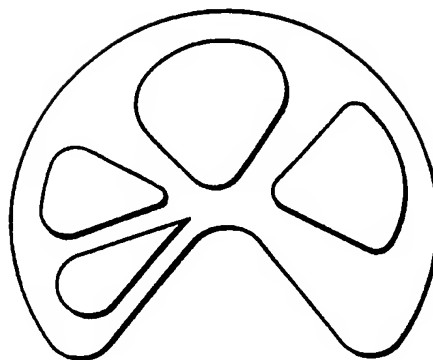


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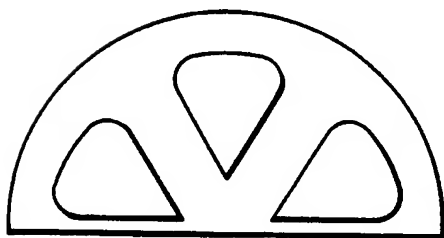
**FIG. 7.**



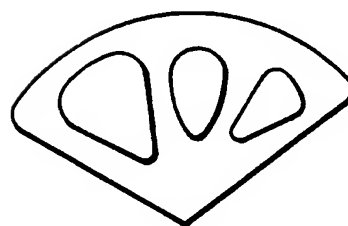
**FIG. 8.**



**FIG. 9.**



**FIG. 10.**



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FIG. 11.

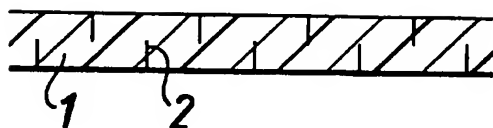


FIG. 12.

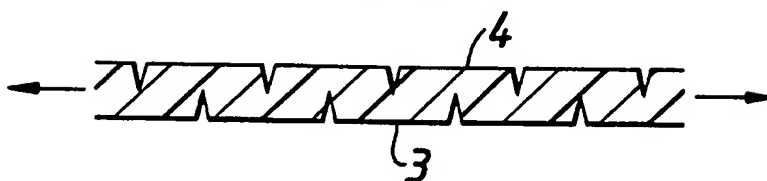


FIG. 13.

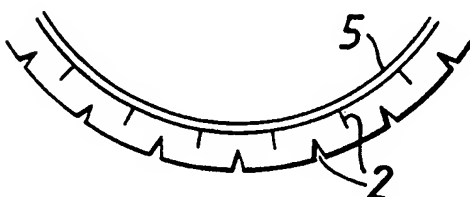


FIG. 14.

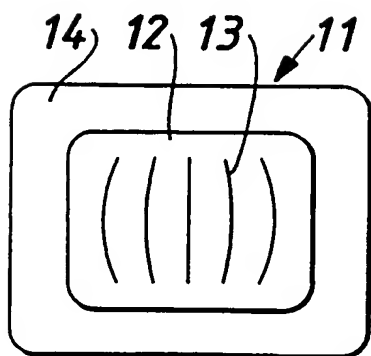
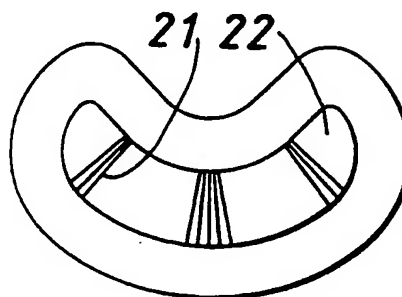


FIG. 15.



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FIG. 16.

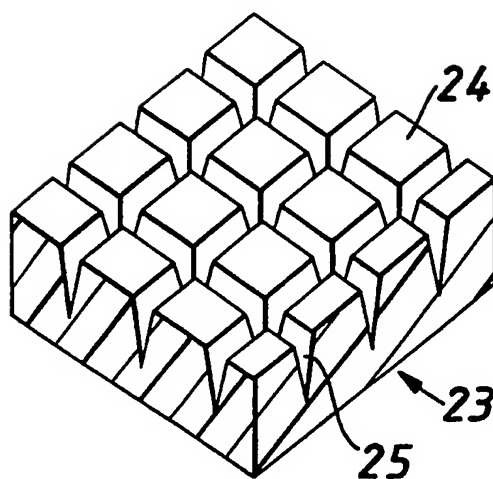
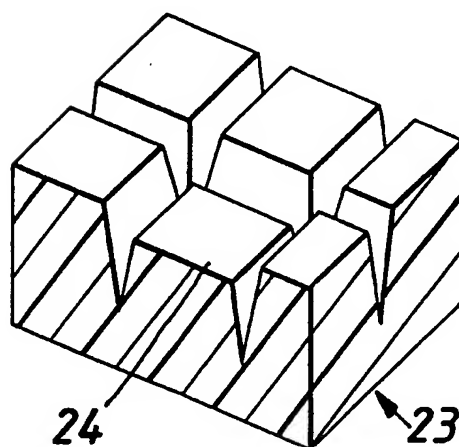


FIG. 17.



# INTERNATIONAL SEARCH REPORT

Inter nal Application No  
PCT/GB 94/02564

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 A61F13/02 A61F15/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,4 913 138 (YOSHIDA ET AL.) 3 April 1990	1-5
Y	see column 6, line 34 - line 56; figure 11	9,10
Y	DE,A,35 39 533 (LIEDTKE) 14 May 1987 see abstract; figures 3,4	9,10
A	US,A,5 263 970 (PRELLER) 23 November 1993 see column 3, line 16 - line 19; figures 6-8	1
A	US,E,33 727 (SIMS) 29 October 1991 see column 2, line 24 - line 31; figures	1
A	US,A,1 845 630 (SCHOLL) 16 February 1932	
A	US,B,4 374 520 (GROSSMAN ET AL.) 23 June 1992	

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- \*&\* document member of the same patent family

Date of the actual completion of the international search

15 March 1995

Date of mailing of the international search report

29. 03. 95

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 94/02564

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-4913138	03-04-90	NONE	
DE-A-3539533	14-05-87	NONE	
US-A-5263970	23-11-93	NONE	
US-E-33727	29-10-91	US-A- 4372303	08-02-83
US-A-1845630	16-02-32	NONE	
US-B-4374520	22-02-83	US-A, B 4374520	22-02-83
		US-A- 4545371	08-10-85